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*A PLEA FOR THE GREATER CARE OF  
IT IN INTRANASAL OPERATIONS.*

BY

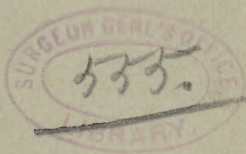
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## THE NASAL MUCOUS MEMBRANE.

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THE GREATER CARE OF IT IN INTRANASAL OPERATIONS.

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IN its normal condition the nasal mucous membrane is of vast importance to the economy in its physiological functions. Besides its part in respiration and in olfaction is the important one of preventing ingress into the system of pathogenic micro-organisms. Its exposed condition and sensitive character render it especially subject to infectious disorders, and hence, after repeated attacks of these micro-organisms, the protecting power of the membrane succumbs and a diseased state results.

That the nature of the normal mucous membrane may be considered, I have here briefly outlined its anatomy.

The pituitary or Schneiderian membrane varies in thickness and vascularity in different parts. It is thickest and most vascular over the turbinate bones, particularly the inferior, and on the sæptum nasi it is also very thick and spongy; but in the intervals between the turbinate bones



and over the floor of the nasal fossæ it is considerably thinner. In the maxillary, frontal, and sphenoidal sinuses and in the ethmoidal cells the lining mucous membrane is very thin and pale. In the region of the external nostrils the lining membrane is stratified squamous epithelium, in the upper or olfactory region it is non-ciliated and columnar, and in the lower or respiratory region and in the sinuses it is ciliated and columnar. The membrane in the respiratory part covers the middle and inferior turbinals and the lower portion of the fossæ, and is studded with racemose glands which open by orifices apparent on the surface. Besides the glands the mucous membrane of the fossæ contains a variable amount of lymphoid tissue, occasionally accumulated into nodules. In some parts large venous plexuses are found encircled, as well as the alveoli of the glands among which they lie, by bundles of plain muscular fibres (Klein), thus forming a sort of cavernous tissue.

The olfactory region includes the superior turbinal and corresponding part of the sæptum. It is extremely vascular, a close plexus of large capillary vessels being found under the lining membrane throughout its whole extent. Its mucous membrane, of the non-ciliated variety of epithelium, is soft and pulpy and delicate in consistence. It has a distinct yellow color. The numerous glands of Bowman in this region open by fine ducts lined with flattened cells, which extend to the surface between the olfactory epithelium cells. In the mucous membrane itself the gland tube is somewhat convoluted and enlarged, and it may have one or two branches. It is limited throughout by a basement membrane, and lined and almost filled with columnar or polyedral secreting cells of a serous type. The gland cells contain yellowish-brown pigment. The gland ducts open occasionally into a ciliated crypt, but more frequently into

a small subepithelial receptacle lined with flattened epithelium, from which a fine tube passes to the surface between the epithelium cells. The olfactory cells have a central process, prolonged as an ordinary nerve fibril, a body or cell with nucleus; above that a peripheral process, terminating in a knoblike prominence in which are the olfactory hairs. The fine varicose central processes of these cells are directly continuous with the fibres of the olfactory nerve, and terminate centrally by dendritic ramifications in the glomeruli of the olfactory bulb.

*Blood-vessels.*—The descending palatine branch of the maxillary artery gives small offsets to the hinder part of the inferior turbinal and meatus. The anterior ethmoidal branch of the ophthalmic artery enters the cavity with the nasal nerves, and is distributed to the mucous membrane of the fore part of the sæptum and outer wall. The posterior ethmoidal branch of the ophthalmic artery sends small twigs to the posterior ethmoidal cells, to the roof, and to the upper part of the sæptum. A branch from the superior coronary of the facial and the lateral nasal artery supply the part near the anterior nares. The several arteries anastomose freely together in the mucous membrane, and are distributed to three sets of capillaries—a periosteal, glandular, and subepithelial.

The veins form a dense plexus in the mucous membrane, those in the deeper parts being especially large and closely arranged, so as almost to approach the structure of a cavernous tissue. This is most largely developed over the whole lower turbinal, the lower and hinder border of the middle turbinal, and the hinder end of the upper turbinal, as well as on the lower and hinder part of the sæptum. A similar dense venous plexus, continuous with that of the nasal fossæ, extends around the nasal duct as far upward as the lacrymal sac; the trunks leaving the cavity accompanying

the arteries, the sphenopalatine vein emptying itself into the pterygoid plexus; the ethmoidal veins joining the ophthalmic vein and the veins of the dura mater, and also sending a branch to join the veins of the orbital part of the frontal lobe of the brain, and small veins passing out at the margin of the nares to join the venous plexus of the upper lip. Some small veins also pierce the nasal bones and the ascending process of the superior maxilla to join the commencement of the facial vein.

The lymphatics are abundant and large. They form a close plexus in the mucous membrane, the branches extending almost to the surface, and a more open plexus of valved vessels near the bone. These are in communication with the lymphatic spaces which inclose the branches of the olfactory nerve, and these spaces again communicate with the subdural and subarachnoid spaces of the cranium, so that the lymphatics of the nasal mucous membrane can be injected from the cranial cavity. Lymphatic nodules are here and there present in the mucous membrane.

It will thus be seen that we have here an intensely vascular and large surface richly endowed with nerve fibres, each normally performing its function.

By far the most frequent abnormalities in the anterior nares that rhinologists are called upon to treat are the diseased conditions of an obstructive nature, and their aim must be to remove these in order to procure free access of air into the posterior nares.

For this purpose various mechanical devices have been used, and it is in the selection of these that much care should be taken in order that the least injury possible to the mucous membrane shall occur, for it has been shown how necessary that membrane is to the economy, and if the removal of any portion of membrane may be avoided it should certainly be done.



That the removal of healthy mucous membrane is often followed by very disagreeable results can not be gainsaid. The very titles of papers presented at the gatherings of rhinologists prove this. The title of a recent paper is The Treatment of Post-operative Ulcers of the Sæptum; that of another, Neurasthenia resulting from Intranasal Operations, etc. Ulcers, bleeding, localized pain, all proceed from the denudation of the membrane.

It would be of interest to note how many of these conditions followed the use of the saw, electric burr, or plane, as these instruments are, in my opinion, the greatest destroyers of healthy membrane.

We can do so well with other means than these mentioned that it seems to me, except for such absolute obstructions as require opening (as in diseases of the accessory sinuses), that the electric burr should be discarded altogether. The electric saw, plane, or shaver are horrible devices, and can work an enormous amount of mischief.

The galvano-cautery is at best a mere temporizing device, rarely curing anything, but chiefly destroying the mucous membrane and thus rendering it powerless for its chief physiological functions. This applies mainly to all conditions about the sæptum. Where the mucous membrane itself is already diseased and redundant, as over the turbinates, the use of the galvano-cautery is of some value.

Admitting, then, that operative procedures are necessary in a given case, and due regard is to be had of the mucous membrane, the question arises, "How shall we operate?"

In all ecchondroses of the sæptum near the alæ it has been my custom to operate as follows: The parts are well cleansed with a spray, an anæsthetic given (either local or general), and an "L" incision is made in the mucous

membrane. The membrane is then seized with the forceps, and with a blunt knife is raised from the cartilage. It peels readily. With a knife the cartilage is excised, the flap of membrane is brought down to its original position, two sutures are introduced, and the wound lightly packed with iodoform gauze. In four cases that I operated in this manner I first inserted a plug of iodoform gauze posterior to the obstruction in the nares, thus preventing the flow of blood into the pharynx. Anæsthesia was general. The bleeding was free, but the field was never obscured, as frequent use of cotton swabs kept it clear and the head was kept dependent. No vessels of any size were encountered, and the hæmorrhage ceased when the mucous membrane was sutured in place. The recovery was complete in each case, and there were no post operative symptoms whatever.

For cartilaginous obstructions other than deviations, the electric trephine has served me best. By introducing the instrument at the point of greatest thickening, it is comparatively easy for the operator to remove the offending cartilage under the mucous membrane. In this manner the flap of membrane is allowed to reunite, which it readily does.

The only instance where the removal of the mucous membrane is not apt to be followed by distressing symptoms is where it is redundant, as over the turbinated bodies, and here the same procedure may be followed as in other mucous membranes. The cold wire snare has proved the most efficacious in my hands. The hypertrophied membrane having been removed, it is imperatively necessary to pack the nostril with iodoform gauze. This renders the wound aseptic, stimulates healing, and checks hæmorrhage. It may be said that the dissecting operation performed for the removal of ecchondroses is too great for



the slight nature of the difficulty. To this I would reply that anything requiring removal should be done in the most thorough manner possible, with a view to the least possible evil after-effects. This applies only to ecchondroses of a fairly large size, not to slight spurs, etc. The nasal mucous membrane is of so much need in the economy that every care should be taken of it, and no labor should be too great to achieve the best practical and scientific results.

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FRANK P. FOSTER, M.D.

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